

**CLIFF-NESTING RAPTORS IN THE NORTH AND SOUTH CAVE HILLS, HARDING
COUNTY, SOUTH DAKOTA: 1997 INVENTORY OF ACTIVE SITES IN 1996**

A Report to:

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ABSTRACT

An inventory of cliff-nesting raptors was conducted 2-4 June 1997 in the North and South Cave Hills (Sioux Ranger District, Custer National Forest), Harding County, South Dakota. This inventory was undertaken to supplement the intensive survey of all South Dakota units of the Sioux District in 1996. In particular, visits to Golden Eagle (*Aquila chrysaetos*) and Prairie Falcon (*Falco mexicanus*) nest sites that were active in 1996 in the North and South Cave Hills were selected as high-priority objectives for the 1997 field effort. A secondary objective was to survey major cliffs in the area of nests active in 1996. In the process, we rechecked several Merlin (*F. columbarius*) territories that were occupied in 1996, and documented active nests of other raptors as they were encountered.

A total of 24 Golden Eagle, 19 Prairie Falcon and 11 Merlin nest sites were checked in 1997. Of 5 Golden Eagle nest sites active in 1996, none were active in 1997; 3 active nests were found, however, one of which was a new site. Six of 10 Prairie Falcon nest sites active in 1996 were occupied in 1997; one additional occupied nest was found. Three of 9 Merlin territories checked were also active in 1997, out of 15 total active nests in 1996; one new occupied Merlin territory was found. Five Red-tailed Hawk (*Buteo jamaicensis*) nests that were active in 1996 were checked; only one of these was active in 1997. One new active Great Horned Owl (*Bubo virginianus*) nest was found in 1997.

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Field work during 1996-1997 was supported through a contract with the Custer National Forest. We especially thank Don Sasse of the Custer National Forest for his interest in this work and his efforts to promote a thorough survey of cliff-nesting raptors in the South Dakota units of the Sioux District. We received many valuable suggestions from Jeff Marks (who supervised and participated in the 1996 survey) on how we should conduct our effort in 1997. Although we did not and could not always follow his suggestions, our inventory nevertheless benefited greatly from his input and insight.

INTRODUCTION AND OVERVIEW OF METHODS

The objective of the 1997 effort was to supplement a comprehensive survey of all South Dakota units of the Sioux Ranger District, Custer National Forest (see Marks and Edwards 1996). The North and South Cave Hills were identified during the 1996 survey as having a large concentration of cliffs suitable as nest sites, especially for Golden Eagle (*Aquila chrysaetos*) and Prairie Falcon (*Falco mexicanus*), and were considered worthy of additional field work. A field inventory for cliff-nesting raptors in the North and South Cave Hills was undertaken in June 1997; we arrived on 1 June, spent 2-4 June conducting the inventory, and departed on 5 June.

Several factors, including lingering snowpack and additional commitments, prevented initiation of field work prior to June and limited the amount of time available for field work. Because of these unforeseen constraints on time spent in the field, we identified as highest priority visits to Golden Eagle and Prairie Falcon nest sites that were active in 1996 in the North and South Cave Hills. A second priority was to check as much cliff habitat as possible for additional active nests. Lower priority were visits to Merlin territories that were active in 1996, and documentation of nesting by other raptor species.

Our methods in 1997 followed procedures used in previous raptor surveys, including the 1996 survey. We used topographic maps and accounts of active nests found in 1996 to formulate our daily traverses. We walked along cliff rims or below cliff faces, scanning for raptors and their nests; periodic clapping of hands was done to flush birds from perches or nests. Hand-clapping was effective in flushing falcons from cliffs or trees. Cliffs were also scanned with spotting scopes and binoculars to search for birds and nests. Evidence of nesting activity included whitewash, recent nest decoration, down, and fresh prey remains. We made an attempt to see nest contents whenever active nests were located; this was not possible for one Golden Eagle nest and several Prairie Falcon nests. If nestlings were visible, we aged them using photographic keys (Lehman no date, for Golden Eagle; Moritsch 1983, for Prairie Falcon). We made noises whenever magpie nests were encountered (to flush possible nesting Merlins), but we did not make a special effort to check all magpie nests thoroughly. If deemed feasible, we attempted to climb to active and 1996 Merlin nests when they were identified. Locations of occupied nesting sites were plotted on USGS topographic maps if sites were new. Otherwise we identified sites using maps of known nest-site locations provided by the Forest Service and in the 1996 report of Marks and Edwards; nest-site identification codes for "old" nest sites were derived from maps and notebooks provided by Custer National Forest and the Marks and Edwards report.

RESULTS AND DISCUSSION

The winter of 1996-1997 was accompanied by considerable snowfall, and spring in 1997 was delayed; we found remanent snowbanks in a few protected places during our June inventory. The cool, late spring may have had some impact on raptor nest success during 1997, but our results cannot be used to determine this. Because of our relatively late start, we have no way of knowing how many raptor pairs may have attempted nesting and failed prior to our arrival.

As noted in Marks and Edwards (1996), information on nesting raptors in the South Dakota portions of the Sioux Ranger District has been incomplete for any single nesting season, with the survey in 1996 being the most comprehensive in recent years. Much historical information on nest locations was collected late in the nesting season or from inactive nest sites during periods after most nesting would have occurred, thus it is unclear how often historical sites are reused. Our results cannot be compared in any quantitative way with the 1996 survey (or any other survey) because our inventory was not as complete. Primarily, our results supplement the 1996 survey by providing additional history on use of particular sites by cliff-nesting raptors, but differences in numbers of active nests found during 1996-1997 do not necessarily represent actual trends in raptor populations in the North and South Cave Hills.

Golden Eagle: We checked the five active nests found in 1996. None of these (3 in the North Cave Hills, 2 in the South Cave Hills) was active in 1997. We did find 3 active nests, all cliff nests and all in the South Cave Hills (Table 1). One of these (GE-073B), discovered unoccupied on 16 July 1979 and inactive when checked on 5 June 1996, contained at least 2 chicks (based on vocalizations) on 2 June 1997. The second nest (GE(O)-9603), inactive when discovered on 28 May 1996, contained 2 chicks about 4 weeks old on 3 June 1997. The third nest (GE-9701), at a new site about 0.5 mi SE of JC Spring, contained 2 chicks about 5 weeks of age. Three of five active nests in 1996 contained 1 chick, 2 contained 2 chicks. Based on nestling ages provided for both years, Golden Eagle nesting in 1997 was later than in 1996 by about 7 days.

We checked a total of 21 historical Golden Eagle nest sites (16 in the North Cave Hills, 5 in the South cave Hills) that showed no evidence of use in 1997 (Appendix 1); this figure includes the 5 sites active the previous year.

Prairie Falcon: Ten active Prairie Falcon nest sites were found in 1996: 9 sites in the North Cave Hills, 1 in the South Cave Hills. We checked all of these sites in 1997 and found 6 (5 in the North Cave Hills, 1 in the South Cave Hills) active in 1997 (Table 1); one additional site not active in 1996 was found. Of the four 1996 sites inactive in 1997, one (PF-9608) was raided by falconers in 1996, at another (PF-058) the female was killed on the nest in 1996 by a Great Horned Owl, and at the third site (PF-9607) the pair appears to have moved along the cliff to the east about 0.25 mi to an historical nest site that was not active in 1996; falconers may have disturbed this pair in 1996 (see Marks and Edwards 1996) thereby inducing the shift in nest site.

Four of the active sites in 1997 (PF-9601, PF-9602, PF-9603, PF-9604) were first found in 1996; the other 3 sites active in 1997 had been discovered prior to 1996. PF-052 was found in 1973, contained at least 2 chicks on 24 July 1979 and contained 3 chicks on 8 June 1996; two chicks about 2.5-3.0 weeks of age were present on 3 June 1997. PF-35PF04 was found in 1973

Table 1. List of occupied raptor nests found in the North and South Cave Hills, 1997.

Species	Nest number	USGS quad.	Date found
North Cave Hills			
Prairie Falcon	PF-9602	Eagles Nest Butte	2 June
Prairie Falcon	PF-35PF04	Eagles Nest Butte	2 June
Prairie Falcon	PF-9601	Eagles Nest Butte	3 June
Prairie Falcon	PF-9604	Ladner SE	3 June
Prairie Falcon	PF-052	Ludlow	3 June
Prairie Falcon	PF-35PF27	Ludlow	4 June
Merlin	ME-9602	Eagles Nest Butte	2 June
Merlin	ME-9609	Ludlow	4 June
Red-tailed Hawk	RT-9603	Eagles Nest Butte	2 June
Great Horned Owl	GHO-9701	Ludlow	4 June
South Cave Hills			
Golden Eagle	GE(O)-9603	McKenzie Butte	2 June
Golden Eagle	GE-073B	Ladner SE	2 June
Golden Eagle	GE-9701	Ladner SE	2 June
Prairie Falcon	PF-9603	Ladner SE	2 June
Merlin	ME-9604	Ladner SE	2 June
Merlin	ME-9701	McKenzie Butte	2 June

and was active on 25 May 1996; the site was also active on 3 June 1997. PF-35PF27, first found in 1973, was inactive in 1996; in 1997 the nest contained 2 chicks 2-3 weeks of age on 4 June. The few data available suggest that nesting for Prairie Falcons may have been delayed in 1997, relative to the previous year at least. At PF-9603 (in the South Cave Hills) 3 chicks about 1 week of age were present on 26 May 1996; on 2 June 1997 the nest contained 3 eggs that were being incubated. This suggests that nesting by Prairie Falcons in 1997 in the Cave Hills may have been late by as much as 14 days. However, at two other active nests in 1997 chicks were 2-3 weeks of age. Age estimates from additional active nests in 1996 are lacking, so the difference between years in stage of nesting at PF-9603 may have been anomalous.

We checked a total of 12 historical nest sites (7 in the North Cave Hills, 5 in the South Cave Hills) that showed no evidence of use in 1997 (Appendix 1); this figure includes 4 sites active the previous year.

Merlin: Marks and Edwards (1996) found 15 active Merlin territories (9 in the North Cave Hills, 6 in the South Cave Hills) in 1996. We did not concentrate on this species during our 1997 inventory, although we revisited as many nest sites as feasible during our checks on Golden Eagle and Prairie Falcon nest sites. In 1997 we revisited 9 of the territories active in 1996 (5 in the North Cave Hills, 3 in the South Cave Hills), and found 3 of these occupied (Table 1: ME-9602 and ME-9609 in the North Cave Hills, ME-9604 in the South Cave Hills); one additional new territory (ME-9701) was found in the South Cave Hills in 1997. ME-9604 contained 5 eggs on 2 June 1997; the nest on this territory in 1996 contained 5 eggs on 27 May (nest site had moved downhill about 80 m in 1997). A second 1996 Merlin nest contained 4 eggs on 27 May. From these few data it is impossible to determine any difference in the timing of nesting between the two years.

We checked a total of 7 historical Merlin territories (4 in the North Cave Hills, 2 in the South Cave Hills) that showed no evidence of occupancy in 1997 (Appendix 1); this figure includes 6 sites active the previous year.

Red-tailed Hawk: Five nests active in 1996 (all in the North Cave Hills) were checked for use in 1997; only one of these (RT-9603) was occupied. Marks and Edwards (1996) found 7 active nests in the North Cave Hills the previous year.

Great Horned Owl: We found one new nest site (GHO-9701), in the North Cave Hills near Ludlow Cave, during our inventory. Two large downy chicks were present on 4 June, one chick at the cliff-ledge nest site and the second chick “branched” and on the ground about 30 m from the nest.

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Appendix 1. List of historical raptor nest sites checked in the North and South Cave Hills that were unoccupied in 1997.

Species	Nest number	USGS quad.	Date
North Cave Hills			
Golden Eagle	GE-35GE5D	Eagles Nest Butte	2 June
Golden Eagle	GE-085	Eagles Nest Butte	2 June
Golden Eagle	GE(O)-9602	Eagles Nest Butte	2 June
Golden Eagle	GE-086	Eagles Nest Butte	2 June
Golden Eagle	GE(O)-9607A+B	Ladner NE	3 June
Golden Eagle	GE(O)-9608A+B	Ladner NE	3 June
Golden Eagle	GE(O)-9601	Ladner SE	3 June
Golden Eagle	GE-9601	Ladner SE	3 June
Golden Eagle	GE(O)-9604	Ladner SE	3 June
Golden Eagle	GE-35GE3	Ladner SE	3 June
Golden Eagle	GE-9604	Ladner SE	3 June
Golden Eagle	GE-098	Ladner SE	3 June
Golden Eagle	GE(O)-9606	Ludlow	4 June
Golden Eagle	GE-35GE55	Ludlow	4 June
Golden Eagle	GE-080	Ludlow	4 June
Golden Eagle	GE-082	Ludlow	4 June
Prairie Falcon	PF-35PF2	Eagles Nest Butte	2 June

Appendix 1 (cont.). List of historical raptor nest sites checked in the North and South Cave Hills that were unoccupied in 1997.

Species	Nest number	USGS quad.	Date
North Cave Hills (cont.)			
Prairie Falcon	PF-35PF3	Eagles Nest Butte	2 June
Prairie Falcon	PF-9605	Ladner SE	3 June
Prairie Falcon	PF-9608	Ludlow	3 June
Prairie Falcon	PF-058	Ludlow	3 June
Prairie Falcon	PF-9607	Ludlow	4 June
Prairie Falcon	PF-35PF13	Ludlow	4 June
Merlin	ME-35M1	Eagles Nest Butte	2 June
Merlin	ME-9601	Ladner NE	3 June
Merlin	ME-9611	Ladner NE	3 June
Merlin	ME-9607	Ladner SE	3 June
Merlin	ME-9612	Ludlow	4 June
Red-tailed Hawk	RT-9601	Eagles Nest Butte	2 June
Red-tailed Hawk	RT-9602	Eagles Nest Butte	2 June
Red-tailed Hawk	RT-9604	Eagles Nest Butte	2 June
Red-tailed Hawk	RT-9606	Ludlow	4 June

Appendix 1 (cont.). List of historical raptor nest sites checked in the North and South Cave Hills that were unoccupied in 1997.

Species	Nest number	USGS quad.	Date
South Cave Hills			
Golden Eagle	GE-9602	Ladner SE	2 June
Golden Eagle	GE-079	Ladner SE	2 June
Golden Eagle	GE-074	Ladner SE	2 June
Golden Eagle	GE-9603	McKenzie Butte	2 June
Golden Eagle	GE-056	McKenzie Butte	2 June
Prairie Falcon	PF-047	Ladner SE	2 June
Prairie Falcon	PF-048	Ladner SE	2 June
Prairie Falcon	PF-35PF15	Ladner SE	2 June
Prairie Falcon	PF-35PF43	Ladner SE	2 June
Prairie Falcon	PF-044	McKenzie Butte	2 June
Merlin	ME-9603	Ladner SE	2 June
Merlin	ME-9605	Ladner SE	2 June
